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Potential and future of novel molecular breeding techniques in plant breeding

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Abstract

Breeding is a fast changing field because of the increasing availability of genome sequences and novel breeding techniques (NBT) which allow a much more scientific approach and predicted outcome of the breeding activities. This is not only obvious from the numerous initiatives both in the public and private areas to sequence more and more genotypes (100 tomatoes, melons, cucumber, rice, cotton, etc.) but also from the possibilities to tackle different problems all at once such as the research on combinatory stresses. Breeding and breeding research have by definition always been fields were interaction with other scientific disciplines was necessary and evident. This is now even more so because with the increasing amounts of data methods and tools have to be designed which make it possible for the individual breeder or researcher to use all available results to design and create the best possible varieties with the highest possible chance. Even more so than in earlier times will the interaction between resistant varieties and a tailor made pest management system be decisive in realising sustainable and durable resistance. This has to be taken up right from the start of a breeding program to obtain maximum effects. Deploying multiple, preferably different, resistance/tolerance mechanisms in one projected variety to realise sustainable results is the way forward.
In this presentation some examples of what these new developments mean for breeding of biotic and abiotic stress tolerant crop plants will be addressed.

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Keywords: novel breeding techniques; climate resiliance; combinatory stresses

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